(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 October 2005 (13.10.2005)

PCT

(10) International Publication Number
WO 2005/095358 A2

(51) International Patent Classification[7]: C07D 239/46

(21) International Application Number:
PCT/GB2005/001188

(22) International Filing Date: 29 March 2005 (29.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0401001-3 31 March 2004 (31.03.2004) SE

(71) Applicant *(for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BE, BF, BG, BJ, BR, BW, BY, BZ, CA, CF, CG, CH, CI, CM, CN, CO, CR, CU, CY, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, FR, GA, GB, GD, GE, GH, GM, GN, GQ, GR, GW, HR, HU, ID, IE, IL, IN, IS, IT, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MC, MD, MK, ML, MN, MR, MW, MX, MZ, NA, NE, NI, NL, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK only)*: **ASTRAZENECA AB** [SE/SE]; S-SE-151 85 Sodertalje (SE).

(71) Applicant *(for MG only)*: **ASTRAZENECA UK LIMITED** [GB/GB]; 15 Stanhope Gate, London Greater London W1K 1LN (GB).

(72) Inventors; and

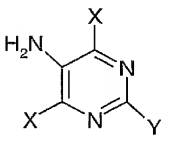
(75) Inventors/Applicants *(for US only)*: **LARSSON, Ulf** [SE/SE]; AstraZeneca R & D Sodertalje, S-SE-151 85 Sodertalje (SE). **RADEVIK, Kajsa** [SE/SE]; AstraZeneca R & D Sodertalje, S-SE-151 85 Sodertalje (SE).

(74) Agent: **ASTRAZENECA**; Global Intellectual Property, S-SE-151 85 Soderatlje (SE).

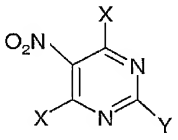
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

*[Continued on next page]*

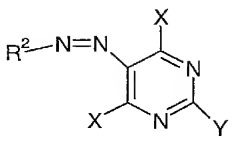
(54) Title: CHEMICAL PROCESS



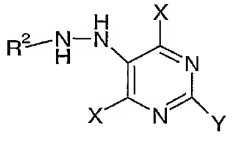

(I)




(II)




(III)




(IV)

(57) Abstract: The present invention provides a process for the preparation of a compound of formula (I); wherein X is halogen; Y is $ZR^1$; Z is oxygen or sulphur; and $R^1$ is $C_{1-6}$ alkyl, $C_{1-6}$ haloalkyl or $C_{3-7}$ cloalkyl; the process comprising either: hydrogenating a compound of formula (II); with a suitable transition metal catalyst in a $C_{1-6}$ aliphatic alcohol, an ether, an hydrocarbon as solvent; or, b) conducting a one-pot hydrogenation of a compound of formula (III): wherein $R^2$ is phenyl optionally substituted by chloro,$C_{1-6}$ alkyl, $C_{1-6}$ alkoxy or $(C_{1-6}$ alkyl$)_2N$; firstly at about 20°C to form a compound of formula (IV): and then at about 40°C; both steps (I) and (ii) being carried out in the presence of a suitable catalyst and in the presence of a suitable solvent.

WO 2005/095358 A2

**(84) Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— *without international search report and to be republished upon receipt of that report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*